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Retrofitting report



Scaling up home energy transformation

The Government's *National Residential Retrofit Plan 2026* sets out an expanded, system-wide programme to accelerate home energy upgrades, reduce emissions, and improve energy affordability, backed by record levels of capital investment and a suite of revised grant supports.

Published by the Department of Climate, Energy and the Environment, the *National Residential Retrofit Plan* outlines how Government intends to scale up retrofit delivery to 2030, positioning residential decarbonisation as central to climate action, energy security, and cost-of-living resilience.

Anchored by four pillars – driving demand and activity, financing and funding models, supply chain and skills, and governance – the plan seeks to address persistent barriers to uptake, including high upfront costs, limited consumer awareness, supply chain constraints, and perceived complexity in the retrofit journey.

The plan builds on recent progress. Since 2019, almost €1.7 billion has been provided in SEAI supports, delivering 244,000 home energy upgrades, including 32,700 fully funded retrofits for households at risk of energy poverty and 18,000 heat pump installations. In 2025 alone, 58,128 upgrades were completed under SEAI schemes.

Driving demand

Government identifies consumer hesitancy and complexity as structural challenges to deeper retrofits. To counter these, a renewed national awareness and demand generation campaign is being funded with €4.2 million in 2026, emphasising comfort, cost savings, and environmental benefits.

The expansion of the 'one-stop shop' model remains central. There are now 28 registered one-stop shops providing end-to-end project management services, managing assessment, grant applications, contractor engagement, and final BER certification. In 2025, 14,016 home energy upgrades were delivered through this mechanism.

Community activation is also prioritised through the Sustainable Energy Communities programme, which enables area-based retrofit planning supported by SEAI-funded energy master plans.

Financing reform

Financial barriers are identified as a principal constraint to scaling delivery. The 2026 capital allocation of €640 million for SEAI residential and community schemes, including €558 million from carbon tax revenues, represents the largest annual investment to date. Under the Department's 2026-2030 NDP Sectoral Capital Plan, up to €3.7 billion in carbon tax receipts will be directed towards residential energy efficiency.

Grant supports are being recalibrated from February and March 2026, while attic and cavity wall insulation grants under the Better Energy Homes Scheme are to be restored to 80 per cent of median costs. A new 100 per cent grant for attic insulation will be introduced for first-time buyers of existing homes, while households eligible for the Warmer Homes Scheme will be able to access fully funded attic and cavity insulation immediately through the Better Energy Homes Scheme to reduce waiting times.

Heat pump supports are also being strengthened. From February 2026, a fixed grant equivalent to approximately 80 per cent of median installation costs (90 per cent for island homes) will apply under the Better Energy Homes Scheme. In addition, the minimum energy uplift requirement under the National Home Energy Upgrade Scheme and Community Energy Grant Scheme will be removed from March 2026 to enable heat pump-ready homes to participate without undertaking additional fabric works solely to meet technical thresholds.

The Government-backed €500 million Home Energy Upgrade Loan Scheme continues to provide loans between €5,000 and €75,000 at interest rates starting from 2.99 per cent, supported by a European Investment Bank guarantee and State subsidy.

Supporting inclusion

The plan places a strong emphasis on energy poverty and equity. The Warmer Homes Scheme, which provides fully funded upgrades to eligible low-income households, has invested €827 million since 2019, upgrading 32,754 homes.

Grant rates for approved housing bodies are set to increase to enable deeper retrofits in the social housing sector, while local authorities will be permitted to access Better Energy Homes grants for shallow measures alongside their deeper retrofit programmes.

Targeted schemes are also being advanced for traditionally built homes, defective concrete block properties, and medically vulnerable households requiring solar PV installations.

Supply chain and skills

Delivering retrofit at scale is framed as contingent on workforce expansion. A 2023 skills analysis identified the need for 22,779 additional entrants to the retrofit workforce by 2030. Approximately 13,254 jobs were supported by home energy upgrade activity in 2025.

Six nearly zero energy building centres of excellence are operational nationwide, with over 18,000 course enrolments since 2020. Apprenticeship reform continues, with 6,362 registrations in construction-related programmes in 2025, up 67 per cent on 2020.

Standards and research are also being developed, including an SEAI study examining the current heat loss indicator requirement for heat pump eligibility and a pilot of 100 high-temperature heat pumps to assess performance and cost implications.

Analysis

The residential building stock remains a significant contributor to the State's emissions, with a substantial proportion of homes built before modern energy standards. Around 16 per cent of dwellings predate 1945, while many others require fabric upgrades to accommodate low-carbon heating technologies.

The 2026 plan aims to scale the retrofitting of the residential sector by combining revised grant supports, loan financing, supply chain development, and governance reform. The plan is also clear of the aim to accelerate delivery while maintaining a just transition for vulnerable households.

In his foreword to the plan, Minister for Climate, Energy and the Environment Darragh O'Brien TD states: "By promoting retrofitting, renewable heating, and solar energy, we will make homes warmer, cheaper to heat, and less reliant on fossil fuels."

Retrofitting for AHBs and local authorities



Electric Ireland Superhomes is a retrofit one-stop shop for approved housing bodies (AHBs) and local authorities.

Electric Ireland Superhomes is a joint venture between Tipperary Energy Agency and ESB (Electric Ireland) established in 2021. We are an SEAI registered one-stop shop looking after all the key stages of a home energy retrofit, from design, contractor selection, project completion and management of SEAI grant funding to bring houses and apartments to a minimum of a 'B2' BER standard.

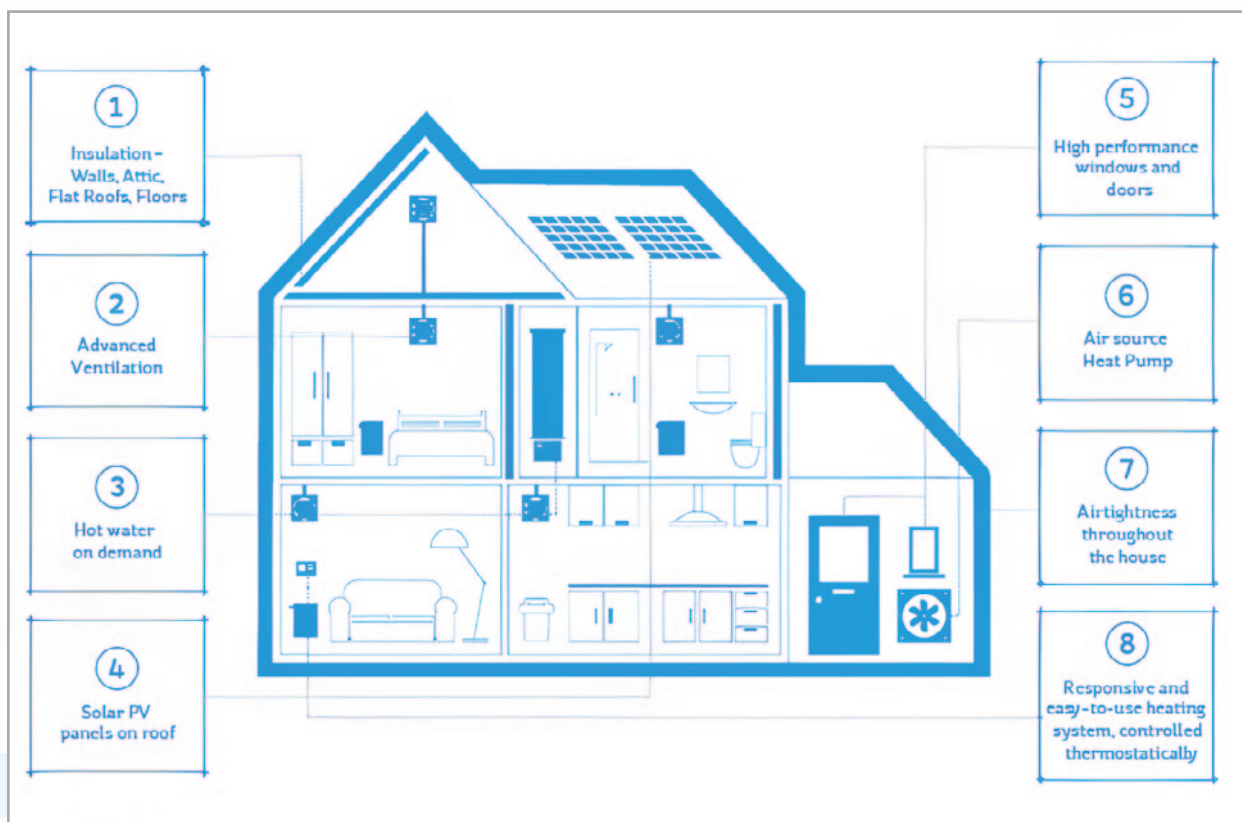
We support larger-scale retrofit projects for local authorities, approved housing bodies and non-corporate landlords under relevant SEAI funding programmes, including the Better Energy Communities Scheme. Electric Ireland Superhomes' vision is to

empower our customers to achieve warmer, healthier, low-carbon homes with a renewable energy focused approach. We are currently on track to achieve our target of retrofitting over 30,000 homes by 2030.

Electric Ireland Superhomes delivers retrofit solutions with the support of a multi-disciplined staff of over 50 people comprising of retrofit advisors, energy engineers, surveyors and BER assessors. We now have a dedicated team that specifically focuses on larger projects with special focus on housing owned and managed by local authorities, approved housing bodies and non-corporate landlords. This team is led by Mike O'Rourke, who has over

28 years' experience in building services engineering, with the last seven years in the housing retrofit sector and supported by David Ahearne, who has over 25 years in project and account management roles and experience within the retrofit sector.

The dedicated Large Projects team bring a wealth of expertise in planning, execution, and oversight, ensuring that projects are delivered on time and within budget. With a keen understanding of the intricacies of project management, they can effectively navigate potential challenges, mitigate risks, and optimise available resources. Their ability to



anticipate potential roadblocks and implement strategic solutions contributes to the overall success of the project.

Ultimately, by entrusting Electric Ireland Superhomes with the oversight of their Energy Retrofit Programme, a local authority or approved housing body stands to benefit from enhanced efficiency, cost-effectiveness, and successful project outcomes.

For local authorities, Electric Ireland Superhomes can provide a range of services to meet their needs from a full energy retrofit consultancy service to the provision of services expected under the Energy Efficiency Obligation Scheme.

From 2022 to date, our Large Projects team has been engaged by several local authorities, for the delivery of energy retrofit works of over 1,000 units.

In line with programme rules, our objective is to deliver a minimum 'B2' post BER rating on all homes. Since 2024, 74 per cent of all our local authority houses achieved an 'A' post works BER rating.

This year, we have been contracted by additional local authorities for their Energy Efficiency Retrofit Programme and we are forecasting significant growth in this sector.

For approved housing bodies and non-corporate landlords, Electric Ireland Superhomes can provide a full one-stop shop service that can avail of the SEAI grants for houses that were built and occupied before 2011 and have an existing BER of 'B3' or lower. SEAI grant supported retrofit measures include insulation upgrades (including roofs, walls, and floors), replacement doors and windows, mechanical ventilation, airtightness, solar PV, and heat pumps.

The process for an energy retrofit starts with an initial consultation to establish your requirements followed by a detailed house survey that includes the building fabric and heating systems. An energy report is then prepared that recommends a package of measures.

Once satisfied with the recommendations in the report, we can finalise the design of the works, prepare documents for tender or pricing, and manage the grant process. We carry

out interim checks on the retrofit works in progress and a detailed final inspection once the project is completed. A health and safety file and post works BER certificate are provided on completion of the project.

Grants offered are provided by the Government of Ireland through the Sustainable Energy Authority of Ireland (SEAI).

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Incentivising retrofitting

Stephen Brophy, principal officer leading the public sector and enterprise energy efficiency section at the Department of Climate, Energy and the Environment, talks to Ciaran Brennan about what the Department is doing to incentivise retrofitting.

Ciaran Brennan (CB): What is the Department doing to drive retrofitting uptake?

Stephen Brophy (SB): We have substantially increased funding every year since 2020; 2026 will be another record year for funding for domestic and non-domestic retrofits. We have grant levels that are up to 80 per cent for some works, 100 per cent grant funding for energy audits for businesses. Beyond that, we have a supply pillar where we work closely with the Department of Further and Higher Education and SEAI to deliver the skills and the people to deliver retrofits, working across the supply chain to ensure that we have everything that we need to make a homeowner's journey really smooth when they arrive at a one-stop shop when they decide they want to retrofit.

“There has to be a product or an upgrade journey that works for everybody.”

CB: What is one measure the Department is implementing which has been effective?

SB: Solar panels have been extremely popular. I think they give that wow factor for people. People like to see solar panels on their house, they like to show the app at their dinner parties and explain to people how they are exporting energy and how their electricity bills have gone down. Schools are really keen to have solar panels installed, business like to have them as a visual. I think the micro-generation support schemes have been way more successful than even we hoped.

CB: What challenges does the Department face?

SB: Heat pump take-up is a lot lower than we would really like. It is not a unique problem for Ireland, it is something that we see across Europe. I think there is a combination of fear of the unknown, consumer resistance, and that really high upfront cost compared to a gas boiler. That is a challenge we have to attack on multiple fronts.

CB: How do you navigate demystifying retrofit technologies?

SB: It is just time. There is research that you need to tell people things a lot of different times and in a lot of different ways before it really flips

how they think about something. One thing that has come up which has stuck with me is that a couple of years ago we were in the middle of Covid. People have actually fundamentally changed how they use their houses since then. Hundreds of thousands of people now work from home. That means they are using their heating in a steady state, that means that a heat pump makes even more sense than it did but that message has not percolated through yet. I think time and hitting those messages will really transform that market.

CB: How does the Government’s target to deliver 300,000 homes by 2030 impact the Department’s retrofitting activities?

SB: That is about 10 houses every day. The numbers have to keep coming through the doors of all those one-stop shops. All those parties have to be engaged, ready to hit the right message for the right person. Our thing is that there has to be a product or an upgrade journey that works for everybody.

Do one measure and then you get a passport which shows you the next thing you can do and then you can plan. When you are ready to pick up the phone, we will get the next one done for you. It is about meeting people where they are and being ready to have a product that works for them.

Profile: Stephen Brophy

Stephen Brophy is the principal officer leading the public sector and enterprise energy efficiency section at the Department of Climate, Energy and the Environment. He leads the Department’s work on the Energy Performance of Buildings Directive. Brophy is also responsible for schemes including the Business Energy User Scheme, the Excellence in Energy Efficiency Design Scheme, and the Energy Efficiency Obligation Scheme.

Grant continues to support low-carbon retrofits across Ireland



The Grant Aerona R290 12kW and 4kW air-to-water air source heat pumps.

Ireland's retrofit challenge is increasingly defined by the ability to deploy solutions across a wide range of property types and retrofit scenarios.

With ambitious national decarbonisation targets in place, success depends on heating technologies capable of consistent performance across diverse applications, while operating reliably in Ireland's climate and integrating well with existing housing stock.

A large proportion of Irish homes were built before modern energy standards, making system design, installer expertise and proven technology critical factors in achieving real-world emissions reductions.

Leading Irish heating technology manufacturer Grant continues to support low carbon retrofits by developing sustainable heating solutions designed specifically for the Irish and UK climate. Through ongoing investment in research, product development and professional training, Grant is supporting homeowners, architects,

engineers, installers and contractors in the delivery of retrofit solutions that improve comfort, reduce emissions, and future-proof homes.

At the forefront of this effort is Grant's award-winning Aerona R290 air-to-water heat pump. Designed in Ireland specifically for local climate conditions, the Aerona R290 provides a next-generation solution capable of supporting a wide range of retrofit applications, from individual homes to larger housing developments.

The Aerona R290 has been recognised for its outstanding innovation at industry awards where it was described as 'redefining heating innovation and sustainability and setting a new benchmark for low carbon heating solutions'. The Aerona R290 was also named 'Heat Pump of the Year 2025' at the Plumbing and Heating Awards.

From a technical perspective, the Aerona R290 delivers reliable operation in challenging environments, achieving A+++ ErP ratings, with SCOPs up to 4.88. The system is capable of 75°C flow temperatures, though correct system design ensures lower, more efficient temperatures are used where appropriate. The range includes five models with outputs from 4kW to 16kW, providing flexibility across a variety of property types. Integrated remote monitoring and management capabilities with the Aerona Smart Controller also support ongoing optimisation and diagnostic support as needed.

Crucially for retrofit projects, the Aerona R290 uses natural refrigerant R290, which has a Global Warming Potential of just three. Combined with ultra-low noise performance recognised by Quiet Mark, the system aligns with national and European sustainability objectives while remaining suited to established residential areas.

Beyond the technology itself, Grant continues to invest in the skills and knowledge required to support



Grant Aerona R290 4kW air-to-water air source heat pump.

About the Grant Aerona R290 Air-to-Water Air Source Heat Pump

- **Innovative design**
 - Environmentally friendly R290 refrigerant
 - Ultra-low noise levels recognised by Quiet Mark
 - Modern styling and colourway
- **Exceptional performance**
 - Highly Efficient A+++ Energy Rating
 - Rated at -5°C air temperature and 55°C water flow temperature
 - Five models with outputs from 4kW to 16kW
 - Remote monitoring and management
- **Peace of mind**
 - Designed by Grant to suit many types of housing
 - Awarded for outstanding innovation
 - 'Heat Pump of the Year 2025' at Ireland's Plumbing and Heating Awards
 - Design and on-site technical support

successful retrofit delivery. Through a combination of onsite training at the purpose-built Grant Training Centre and online learning via the Grant eLearning Academy, installers and industry professionals can access up-to-date courses on products including the Aerona R290 heat pump. This focus on education supports consistent

installation quality and helps ensure that retrofit systems perform as intended over their operational lifetime.

W: www.grant.ie
Facebook and X: @GrantIRL
Instagram: @Grant_IRL
LinkedIn: GrantEngineeringULC
YouTube: GrantEngineeringIE

Grant training courses

Grant continues to support those working in the trade and on retrofit and new build projects through a range of training courses covering products including the Grant Aerona R290 heat pump. Courses are available on site and online through the Grant eLearning Academy.

For more information on training, email training@grant.ie





Bio-based and circular solutions for retrofit

Bebhinn Kennedy, project officer at the TUS Sustainable Development Research Institute, discusses how TUS is developing bio-based retrofit solutions and how they can be applied to heritage buildings.

Kennedy outlines two projects: DeCO2 (Dynamic Decarbonization Pathways Framework: Integrating Technological, Social, and Policy Innovations for Sustainable Renovations in the Built Environment) and HeriSol (HeriSol – Prosumer Solutions for Listed Buildings Based on Building-integrated photovoltaics BIPV).

DeCO2, funded by the European Commission under Horizon 2020, is a European project that focusses on creating a decarbonisation pathways framework “integrating technological, social, and policy innovations for sustainable renovations in the built environment.” Kennedy outlines the project objectives:

1. showcase and implement circular and technological innovations that contribute to the decarbonisation of the built environment;

2. foster social innovation by people-centred, inclusive, creativity-driven, participatory processes and activities;
3. promote policy innovation by providing practical guidelines to public authorities;
4. demonstrate the effectiveness and viability of innovative digital solutions within the three demonstrator sites; and
5. assess the scalability and replicability of the demonstrated built environment decarbonisation pathways.

The demonstration building in Ireland is O’Connell Avenue FET Campus, owned and operated by Limerick and Clare Education and Training Board (LCETB). This building is “large-scale” and comprises “mainly heritage buildings”.

“We are looking at a location-based, user-centric portfolio of materials and renovation systems that is built to embrace local industrial ecosystems and verticals,” explains Kennedy.



“The overall objective of HeriSol is to demonstrate the innovative integration of clean energy solutions into architectural heritage.”

Digital tools for decarbonisation

DeCO2 digital tools aim to “speed up the transition of the construction industry towards decarbonisation through Construction 4.0 enablers”. Construction 4.0 refers to digital advancements to progress the construction industry. Kennedy explains that the regulatory sandboxes in DeCO2 “establish safe spaces for legal and regulatory testing of innovations”.

Bio-based measures

As part of the project, TUS aims to improve the energy efficiency of the campus. Ian Major’s team at the Polymer, Recycling, Industrial, Sustainability and Manufacturing Research Institute (PRISM) at TUS is developing bio-based insulation installations that sequester carbon for the site.

TUS will also assess installing green roofs, vegetated roof systems, at the site. “There are huge benefits to green roofs, but when you actually look at their build-up, there are lots of plastic-based components,” says Kennedy. “The question that must be asked is: how green is the green roof you are installing?”

TUS-PRISM is examining how polymer-based layers in green roofs can be replaced with bio-based solutions. Green roof testbeds will be installed on the roof of the FET College campus’ gymnasium with bio-based components replacing the plastic elements and their performance will be monitored.

Additionally, as part of other retrofit upgrades, light fittings are being upgraded to LEDs and more energy efficient windows are being installed. TUS-SDRI and LCETB will utilise digital twin technology to monitor these retrofit upgrades and assess feasibility of other measures at the site.

Continuing, Kennedy says: “We are developing practical retrofitting and circular guidelines for the construction industry and building owners. Within the DeCO2 project, TUS recently developed a circular toolkit and that is looking at materials and how we can replace those materials as well.”

She explains that TUS-PRISM has created a panel that will simulate the performance of an insulated plaster slab which was installed in the gymnasium building. Heat loss from the panel will be tested for 10 days and this data will then be analysed to understand its performance before the next insulation sample is installed and monitored.

HeriSol

Kennedy also discusses the HeriSol project which aims to provide “prosumer solutions for heritage buildings based on building integrated photovoltaics (BIPV)”. HeriSol is co-funded under the Clean Energy Transition Partnership.

“The overall objective of HeriSol is to demonstrate the innovative integration of clean energy solutions into architectural heritage, converting heritage buildings from consumers to prosumers and thus into active elements of the energy system,” outlines Kennedy.

The project includes the creation of a digital twin, which enables real time monitoring of a heritage building’s energy performance and turns a historical site into a smart, active participant in efficient energy management.

She indicates that solar panels “are not the most aesthetically pleasing”, adding that people are unsure whether to install solar panels on heritage buildings. However, she explains how BIPV can address this problem.

“The BIPV product that is being worked on in this demo site is going to morph onto the roof and take on the slate or tile finish.”

Kennedy explains that solar PV will be installed on the Limerick City Gallery of Art along with bio-based insulation. Samples of tiles have been taken from the site and sent to project partners in Germany. BIPV panels using morpho film technology are being developed to mimic existing materials.

Additionally, TUS is developing a bio-based polyurethane (PU) panel which will be installed at the art gallery. “We are evaluating the insulation performance versus standard foams using the formulas they are developing at TUS PRISM,” says Kennedy.

TUS-PRISM is investigating the feasibility of non-isocyanate bio-based PU foam. Furthermore, panels are being analysed to discern their physical and thermal performance.

The team is also developing a mycelium-based insulation which is a “complete bio non-chemical alternative to PU”. Next, PRISM aims to test full-scale prototype panels which will require scaling up of mycelium growth.

“This product is almost ready to come to market; it just needs some more feasibility testing. Give it a few more years and you never know; you might be buying mycelium-based insulation,” says Kennedy.

Homes made future-proof: Retrofitting at Tuath Housing



Building Services Engineer Paul Grennan on site with a contractor during energy upgrade works.

Tuath Housing is Ireland's largest approved housing body (AHB), now managing over 17,500 homes across the country. The organisation has grown in scope as well as scale in recent years; putting sustainability at the centre of our homes.

"We understand the responsibility we have to lead by example," says Jennifer Whitty, Sustainability Manager at Tuath. "We are ambitious in our aim to provide secure, quality homes in vibrant communities; while also reducing impact on our planet."

Tuath's dedicated sustainability team supports colleagues across the business to embed this core principle in all operations. With energy efficiency a key aim for reducing reliance on fossil fuels and lowering greenhouse gas emissions, Tuath has been evaluating its older housing stock and has embarked on an ambitious programme of retrofitting.

Impact through energy efficiency

Tuath's Energy Upgrade Programme brings together two core priorities: improving quality of life for residents and supporting Ireland's climate goals. By enhancing the energy efficiency of its homes, Tuath aims to reduce carbon emissions, lower energy costs for residents and future-proof its housing stock.

By end of 2025 Tuath had completed 711 cumulative retrofits. Works include replacing traditional gas central heating systems with air-to-water heat pumps, installing new windows and doors, insulating homes and adding solar panels. The latest figures show that 88 per cent of Tuath-owned homes now have a minimum BER rating of B2, while 81 per cent of Tuath-owned homes have a BER A+ rating, an increase of 5 per cent on the previous year. Looking ahead, the organisation has committed to upgrading its owned housing stock to a minimum BER of B2 by 2030.

"We are very pleased with the quality of work delivered through the retrofit programme, which has improved the quality of homes and increased comfort levels for our residents," says Paul Grennan, Building Services Engineer with Tuath.

"Collaboration with the Sustainable Energy Authority of Ireland (SEAI) and our retrofit contractors has been key to the programme's success; helping to minimise disruption and ensure residents are supported in adapting to new technologies such as heat pumps."

Learning from experience

With the energy upgrade programme growing, Tuath is now focusing on the lessons it can draw from the retrofitting journey to date. Whitty and her team have commenced a detailed impact assessment, examining the technical performance of retrofitted homes and capturing stakeholder feedback.

"We want to gain deeper insight into what works well, and where there are opportunities to improve the experience for everyone involved," she explains.

Tuath has invested heavily in retrofits, spending over €3.3 million on energy upgrade works in 2025 alone. The assessment will capture the impact of this investment on energy efficiency within homes. It will also examine how retrofits are experienced in practice, including resident understanding of new heating systems, concerns around



An air-to-water heat pump installed at a home as part of an energy upgrade.

energy costs and the level of disruption during works.

Initial findings are promising, with residents reporting warmer homes, fewer draughts and reduced noise following fabric and heating upgrades. There is also evidence of reduced energy consumption and running costs.

Sustainability Coordinator Caoimhe Magee, one of the project leads, says resident feedback is central to the future success of the programme.

“Capturing our residents’ experience is crucial as we continue to upgrade our housing stock,” she says. “We want to understand the positive impact that retrofitting has had and apply those lessons as the programme continues to grow.”

Collaborating to overcome challenges

Upgrading older housing stock is recognised across the public housing sector as essential but is not without its challenges. Cost is a primary challenge, making collaboration with sector and statutory partners critical. Tuath has worked closely with fellow AHBs in the Irish Council for Social Housing (ICSH) and the Housing Alliance, alongside government partners including the Department of Housing, Local Government and Heritage, the Department of Climate, Energy and the Environment and the SEAI, to ensure continued funding.

Tuath recently welcomed the SEAI’s announcement of a boost in funding for retrofits for AHB homes later this year. Under the *National Residential Retrofit Plan 2026*, grants for energy upgrades for AHBs will be increased to around 75 per cent of the overall cost, rising

to around 80 per cent for homes facing fuel poverty. Together with the support available from obligated parties under the Energy Efficiency Obligation Scheme (EEOS), this could provide AHBs with funding in excess of 90 per cent of the cost of projects. It is a hugely positive step, according to Whitty.

“This outcome is testament to what can happen when sector partners come together to address common challenges in tackling climate change,” she says.

“Our external stakeholders not only listened but took action, enabling AHBs to access greater grant funding, making a real impact on decarbonisation of the sector.”

Another challenge is that carrying out energy upgrades at scale is a relatively new piece of work for AHBs. Again, sector collaboration is essential in overcoming gaps in knowledge.

“The sector is at the beginning of its retrofitting journey, but the strong working relationships and exchange of knowledge between peers gives me full confidence that our sector can contribute meaningfully to Ireland’s national climate targets,” says Whitty.

W: www.tuathhousing.ie

The logo for Tuath Housing features a stylized orange house icon above the word "Tuath" in a large, bold, dark grey sans-serif font, with the word "Housing" in a smaller, lighter grey sans-serif font below it.



Designing with empathy



Empathy-led design can encourage people to retrofit their homes in a way that current measures are failing to achieve, Steve Hall, political economist of energy futures at the University of York, tells *eolas Magazine*.

“People will make big decisions on their home when it satisfies emotional needs, not just financial payback criteria,” says Hall.

“The messaging seeking to incentivise retrofitting that is rooted in cost and carbon savings does not hit home. Incentives are not triggering change. Between 60 and 80 per cent of households who received subsidies for retrofitting would have done it anyway.”

He indicates that people may not always understand their options regarding retrofitting, are not necessarily equipped to maximise utility, and can be inconsistent in their choices.

Hall says a person’s perspective on their home corresponds with how many improvement measures they decide to make. This perspective is influenced by their stage in life, and whether they view their home as starter, fixer-upper, or forever home. Understanding this perspective enables market segmentation.

“If we want to understand people’s stories, we need to start with empathy in the types of policy that we design,” says Hall.

A partnership between the University of York and various combined authorities (city region level local governments),

along with the UK Energy Research Centre, found that a more relational and human-centred approach to people’s decision-making would be more effective in achieving retrofit uptake.

Hall demonstrates the value of human-centred design by recounting a use case from the book *Creative Confidence* by co-founders of design practice IDEO. This case shows how design thinking was applied to MRI scans of children. “When small children come for an MRI scan, they often need sedating because it is scary,” explains Hall.

Redesigning the MRI machine was not possible, but altering the experience of an MRI scan was. Providers turned the experience into a story for children, such as pretending they were going on adventure. This led to an 80 per cent reduction in sedations. “A huge difference just by taking a different perspective,” says Hall.

Retrofit Policy Lab

The university’s work on this empathy-based approach was synthesised into the Retrofit Policy Lab website. It features a persona box comprising multiple chatbots representing stakeholders in the rental market with varying positions on energy, climate, and retrofit. The site aims to provide an understanding of these stakeholders on a one-to-one basis.

Wendy, one of the chatbots, is a 42-year-old self-employed mother living in a heritage semi-detached in Whitby, north Yorkshire. Hall states that “the idea that she is going to take on a deep fabric first retrofit is bananas”.

“Wendy is not disengaged, she is knackered,” explains Hall, adding: “But there is a way you can bring Wendy along with you.”

For people like Wendy, Hall asserts that you must reduce the expectations of what she can accomplish in her home regarding retrofitting. Therefore, it is important to focus on delivering adjustments with a positive impact which can be felt quickly.

Hall discusses a study conducted in the South Yorkshire Mayoral Combined Authority. It explored different relationships in the rental market and how it relates to the energy performance of the property. “Low- to mid-income, early career young people need different stuff than hard-pressed tenants in the lowest income group,” explains Hall.

This does not mean that a separate policy has to be designed for each group, Hall says, adding: “One size does not fit all but we think about five sizes fit most. It is about designing that journey in a different way.”

“We must design differently because you do get to a point where people are just not interested in grants.”

Different narratives on retrofitting will work for different stakeholders. “We must design differently because you do get to a point where people are just not interested in grants,” says Hall.

“This is not because it is not attractive for them but because it is not landing in their world. When you achieve that, it enables you to build that bridge between what you want them to do and what they are likely to take up.”

This requires “empathy mapping”, where a profile is built on landlords which considers their retrofitting efforts, smart metre data, and their buildings’ energy performance certificate (EPC), the UK’s equivalent of the BER. Hall says it is also valuable to speak to landlords to gain an understanding of their perspectives on retrofitting. He adds that it is important to reflect landlords’ concerns in policy.

The University of York synthesised landlords’ perception of their treatment of tenants and their emotions and created a tool called ‘Pragmatic Paul’. “All of my economic thinking comes from the understanding that people make emotional decisions, not rational decisions,” says Hall.

“Our job with ‘Pragmatic Paul’ is to find policy that flips those emotions. Instead of worried, they need to feel confident. Instead of confused, they need to feel informed.

“We need a prototype solution that is going to land in their relational and emotional world in that way and then we design something from there.”

The solution they created was the LetZero project. It is a three stage journey aimed at delivering fabric improvements for landlords. Stage one includes an initial review to see how challenging it would be to improve a landlord’s property portfolio to EPC C.

In stage two, landlords are provided with a retrofit scenarios report that compares renovation pathways to EPC C. Stage three involves the renovation process which Retrofit Policy Lab assists landlords in navigating.

Concluding, Hall says: “That is where empathy-led design gets you. It offers a different perspective on a problem we often think is too big and scary to do anything but throw a lot of capital at.”



Cherrymount House Project.

Building better: A sensitive approach to retrofitting traditional buildings

As Ireland accelerates efforts to improve the energy performance of its existing building stock, traditional buildings present a significant opportunity to increase energy efficiency, as well as specific challenges, writes Niall Crosson, Group Technical Director, Ecological Building Systems.

These buildings form a substantial part of our country's landscape, and their retrofit requires a sensitive, informed approach, one that improves comfort and efficiency while respecting historic fabric, performance and character.

Traditional buildings need a sympathetic approach to retrofit because they are constructed and perform in fundamentally different ways to modern buildings. This has been clearly outlined in the recently-published government guidance *Improving Energy Efficiency in Traditional Buildings*. Built with breathable materials such as stone, brick, timber and lime, these buildings manage moisture through natural evaporation rather than impermeable barriers.

SPAB, the RIAI and other conservation bodies consistently emphasise minimal intervention, repair over replacement, and the use of compatible materials to avoid trapping moisture and causing long-term damage. Retrofit measures must respect historic fabric, architectural character and traditional performance,

ensuring energy improvements enhance comfort and sustainability without compromising durability, significance, or the building's ability to breathe.

At its core, building better in traditional buildings is about balance. Rash interventions and the use of inappropriate impervious insulation or decorative finishes can cause long-term harm. It is essential that these buildings continue to provide safe, healthy and beautiful places to live and work, while remaining viable and relevant long into the future.

Why traditional buildings require a more sympathetic approach

Traditional buildings are typically constructed using permeable materials and assemblies that rely on moisture movement and evaporation to maintain fabric health. Building elements are in a constant state of flux, moving between moisture absorption and desorption. Thermal upgrades must respect and preserve this hygrothermal behaviour.

The inappropriate use of impermeable materials risks moisture entrapment, fabric decay and long-term deterioration. Desktop hygrothermal assessment tools, such as WUFI, a support service supplied by Ecological Building Systems, assists in assessing moisture risk and identifying the most appropriate thermal solution.

The historic fabric of traditional buildings embodies their architectural, cultural and evidential significance. Thermal interventions

should minimise harm, avoid unnecessary loss of original material and, where possible, be reversible, in accordance with established conservation principles.

Traditional buildings also exhibit thermal performance characteristics that differ fundamentally from modern construction, often relying on thermal mass and vapour-permeable materials to regulate internal conditions. Retrofit strategies must therefore adopt a whole-house approach, informed by a thorough understanding of traditional construction methods, to avoid inappropriate or ineffective interventions.

The application of modern impervious paints, finishes and synthetic insulation materials can disrupt moisture movement, increasing the risk of condensation and fabric deterioration. Achieving an appropriate balance between energy conservation and a moisture-open thermal strategy, while also reducing draughts through improved airtightness and providing effective ventilation, is essential to delivering a comfortable, resilient and durable retrofit solution.

Inappropriate thermal upgrades can introduce unintended consequences such as condensation, timber decay, masonry damage or reduced indoor air quality. A conservation-led approach requires holistic assessment of building fabric, ventilation and use, ensuring that energy efficiency improvements enhance, rather than compromise, long-term sustainability.

Learning from traditional buildings

In a changing climate, contemporary construction can learn much from our forebears. Thousands of traditional buildings across Ireland stand as proof of their resilience and durability. They respond to local climate through generations of knowledge, using locally sourced materials, regional craftsmanship and a clear focus on longevity.

From the thatched cottages of Donegal to traditional farmhouses across the Lake District in the UK, these buildings are deeply rooted in place. They embody principles now recognised as essential: reuse of materials compatible with both building fabric and climate, adaptable use of space, and careful material optimisation. Thermal stability, thoughtful use of light and natural airflow combine to create robust and sustainable building fabric.

In many cases, demolition and replacement carries a significant carbon burden. Refurbishment, by contrast, is key to retaining built heritage, providing much-needed housing and reusing materials with minimal environmental impact. Like fingerprints, no two traditional buildings are the same. There are no quick wins when it comes to their thermal refurbishment.

Successful outcomes come from careful assessment and a considered, sensitive approach, that retains key architectural features while delivering meaningful thermal improvements through breathable materials and finishes.

Building better in practice

For over 25 years, respect for tradition and the unique qualities that define traditional buildings has driven our work at Ecological Building Systems. At our heart is providing best-practice guidance with integrity and seeking appropriate thermal solutions and decorative finishes, solutions that work with the building fabric and deliver comfort and stability, ensuring buildings remain warm, characterful and enduring for decades to come.

As conservation architect Fergal McGirl FRIAI notes: “The area of retrofit of historic buildings is a challenging one that requires careful technical and heritage assessment of the structure’s characteristics to ensure appropriate approaches are followed. Ecological Building Systems have developed a suite of materials in recent years that are compatible with traditional buildings and offer flexible solutions to a number of the issues that arise.

“During the Cherrymount House, Phibsborough project, the technical staff provided comprehensive advice and risk assessment at specification stage that was supported by site inspections during construction stage to maintain quality control.”

In my experience, after almost 25 years in building, one thing has remained constant: people value beauty, comfort and stability. This was true when our earliest ancestors sought refuge in Neolithic caves, and it remains true today in low-energy contemporary buildings.

At its simplest, building better should give occupants a sense of wellbeing, comfort and solidity, equally applying to traditional and modern construction. As we look ahead, we are choosing to lean more clearly into what has always guided our work: building better.

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BUILDING SYSTEMS



Sustainable living with the Mitsubishi Electric Ecodan Heat Pump

Mitsubishi Electric Ireland highlights the personal retrofit journey of Irish architect, television presenter, and brand ambassador Dermot Bannon, whose transformation of a 1920s Drumcondra home has become a benchmark for comfort, efficiency and sustainable living.

Central to the project is the Mitsubishi Electric Ecodan air source heat pump, delivering reliable heating, abundant hot water and a significant uplift in energy performance.

When Bannon purchased the century-old property in 2018, it suffered from poor insulation, unreliable heating and frost-lined windows in winter, all symptomatic of its original G BER rating, the lowest on the national scale. Bannon embarked on a deep retrofit in 2019 with a clear objective to create a modern, efficient home capable of meeting and exceeding contemporary energy standards.

“We knew that breathing new life into an older structure meant rethinking every element of its performance, from insulation and ventilation, through to heating and everyday liveability,” says Bannon. “Selecting the right technology was essential to achieving a comfortable, future ready home that also aligned with Ireland’s shift away from fossil fuels.”

Bannon’s retrofit strategy was built on three core principles: deep insulation, high-quality ventilation and an advanced heating system. At the heart of the design, Bannon specified the Mitsubishi Electric Ecodan heat pump.

“After some research, we knew the Ecodan system would allow us to enjoy cosy, reliable heating and hot water while significantly reducing our carbon footprint.”

Despite understanding the theory behind heat pumps, Bannon sought real-world reassurance. He consulted plumbers and installers he trusted, asking one simple question: “If you were installing a heat pump in your own house, which one would you choose?” The answer, he recalls, was Mitsubishi Electric Ecodan.

“Installing the Ecodan heat pump was a natural choice for a home where both comfort and environmental responsibility were priorities,” added Bannon. “It is a great example of how modern technology can complement older buildings.”

Since installation, comfort has been consistent year-round. “One of the biggest surprises has been consistency,” said Bannon. “Nothing changes from July to December, the house feels the same all year round. You do not think about heating anymore, and that’s the ultimate success.”

Even high-demand scenarios are effortless, delivering what Bannon describes as “infinite hot water”. “We never have to control anything or switch anything on,” he explains. “It is invisible heating; it just works.”

Watch the full case study:

W: <https://es.mitsubishielectric.ie/the-heating-hub>



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Watch the full
case study here



Comfort by Design - Dermot Bannon's Ecodan Heat Pump Experience

How an architect passionate about sustainability replaced his gas boiler with a Mitsubishi Electric Ecodan heat pump, transforming his century-old, G-rated house into a modern and efficient low-carbon home.



Retrofitting the private rental sector

Janez Kren of the Economic and Social Research Institute (ESRI) discusses the energy efficiency of Ireland's private rental housing stock, the cost of upgrading it, and the capacity of landlords to finance those upgrades.

The private rental sector has grown steadily over time and now plays a much larger role in Ireland's housing system. "30 years ago it was under 10 per cent, but now it is 21 per cent of the overall housing stock."

The profile of renters has also shifted: "In the past it was more of a transitional thing. Renting is no longer confined to younger households, just under half of all households with the reference person aged 30 to 34 are still in the private rental sector. Even when the reference person is 50 years old, still about 10 per cent of these households are in the private rental sector."

Research shows that rental properties are typically less energy efficient than owner-occupied homes. "The rental sector is consistently less energy efficient compared to owner-occupied housing," Kren says.

A central issue is the split incentive. "In a typical arrangement, the tenant pays for the energy bills but they cannot upgrade themselves," he explains. "The landlord will have to pay, but the tenant benefits, and there is no direct incentive there."

Information gaps also play a role. "Prospective tenants will not really account for or will not know what is the expected bill cost based on the property," Kren says. In a tight housing market, the ESRI researcher states that "the energy efficiency of the building or the apartment will not be really on the top of the list in terms of what tenants are seeking".

Assessing rental stock

To estimate the energy efficiency of the rental sector, the ESRI combined census data with Residential Tenancies Board (RTB) registrations and BER certification records. “From 2022 there is a mandatory annual registration of every rental property in Ireland,” Kren says, providing a baseline estimate of the stock.

However, data gaps remain. “Over half of registrations do not have BER information,” he says. As a cross-check, the analysis also uses BER data where the reason for certification is listed as rental, although “both data sets are much fewer observations than there should be, so we have to do some adjustment on that”.

After correcting for missing data and selection bias, the results show a clear pattern. “About 6 per cent of rental housing stock is F or G-rated, 8 per cent is E, and the majority, about 60 per cent, is C or D,” Kren says. “There are about 21 per cent that are A or B-rated.”

Protected structures were excluded from the analysis. “We estimate that about 5.5 per cent of the rental housing stock is in protected buildings,” he explains. “They will have very different costs to upgrade, so we excluded them from the analysis.”

The cost of upgrading

The second stage of the research estimates retrofit costs using data from local authority social housing upgrades and SEAI one-stop shop projects. “What we have is the total cost of the upgrade, the energy efficiency before and after, and some basic characteristics,” Kren says.

Costs rise sharply for the least efficient properties. “If a building is currently G-rated, to get to B will be about €43,000,” he says, emphasising that these are average figures and that “there is lots of variation there”.

Applying these costs across the rental stock produces large aggregate figures. “If you focus on the G-rated properties, which are about 10,000 units, that is about €430 million,” Kren says. “If you put everything together, from G to C, the total cost is around €7 billion.”

A more limited approach still implies substantial investment. “If you just want to upgrade everything that is G, F or E, the total cost is about €1.7 billion,” he says.

Can landlords finance retrofits?

To assess landlords’ financial capacity, the ESRI used household survey data focused on private, household landlords rather than institutional investors. “About 80 per cent of all rental housing stock is with landlords with less than 20 properties,” Kren says.

Many landlords rely primarily on non-rental income. “For 60 per cent of landlords, the rental income is less than 20 per cent of their overall income,” he explains. While median net wealth is relatively high, “most of it is the property itself,” and “only about €30,000 median is in more liquid assets”.

The result is limited capacity to self-finance upgrades. “Half of the landlords would not have sufficient internal funding to cover a €25,000 investment,” Kren says. “Only about 40 per cent of household landlords could directly fund a €10,000 investment.”

Age is another barrier. “Many landlords are 50 or more, which would be another barrier to obtaining bank loans,” Kren explains.

Policy considerations

Kren states that improving energy efficiency in the rental sector will require targeted policy intervention. “Most landlords would not be able to afford outright,” he says. “There will be need for substantial, external financing.”

He also highlights the risks for tenants. “Many with low income are renters,” Kren notes, and “the renters with the lowest incomes tend to live in the least energy efficient buildings because they tend to be the cheapest”. Any retrofit strategy, he argues, must account for “the increased risk of eviction and increasing rent”, particularly for more vulnerable households.

“That is really the challenge,” Kren concludes. “The rental sector is more challenging than owner-occupied housing.”

SSE Airtricity Home Energy Upgrade: Making Irish homes cosier and more energy efficient



SSE Airtricity is working with governments, local authorities, and domestic customers to support the decarbonisation of homes across the island of Ireland.



SSE Airtricity Home Energy Upgrade

As a leading provider of cleaner, greener energy for homes and businesses across Ireland, we are all about making Ireland a more sustainable place.

Stuart Hobbs is the Director of SSE Airtricity Energy Services (AES), a business dedicated to delivering home energy upgrades and utilising energy efficiency technologies to deliver a cleaner greener environment. SSE AES offers home energy upgrades under a number of different government-funded programmes: SEAI One Stop Shop retrofit programmes, Better Energy Homes, local authority energy efficiency retrofit programmes (EERP), and SEAI Warmer Homes. Up to 1.5 million homes in Ireland are in need of energy upgrades by 2050, as energy efficient buildings are essential to meet our climate action targets. These upgrades typically include external wall insulation, energy efficient windows and doors, attic insulation, heating controls, heat pumps, solar PV and battery systems, and electric vehicle (EV) charging points.

Part of the Irish Government’s *Climate Action Plan* includes a national retrofit programme aiming to see 500,000 homes, one-third of Ireland’s housing stock, retrofitted to a ‘B2’ building energy rating by 2030. SSE AES is supporting the retrofit of 40,000 homes in Ireland over the next 10 years, with over 5,000 upgrades already completed. These works will drastically reduce the emissions of thousands of homes, saving millions on energy costs for consumers and making their homes warmer, healthier. Once delivered, this will equal approximately €20 million in reduced energy costs every year.

1. One Stop Shop

An SSE Airtricity Home Energy Upgrade is the perfect way to upgrade your home. Hobbs states: “We offer an award-winning retrofit service with a full range of home upgrade options, expert project management and a streamlined grant application process. We have partnered with Ireland’s leading experts in energy efficiency upgrades. From solar PV to windows and doors, internal and external insulation, heat pumps, and EV chargers, we only work with the best. Our customers receive a free home consultation to discuss their home upgrade requirements and receive expert recommendations from our team of specialists. It is one call, it is one job, it is one point of contact.”

2. Local Authority and Approved Housing Bodies Retrofits

SSE Airtricity has been providing home energy upgrades since 2012, working with SEAI, local authorities and other housing bodies on joint initiatives. SSE AES help local authorities deliver their Energy Efficiency Retrofit Program (EERP) obligations by taking a lot of the hassle and complexity away, enabling them to deliver larger projects at a better cost and with more flexibility than

their own resources might allow. “Over the last decade, we have delivered significant energy upgrades to fuel poor and social housing units, and we have significant ambitions to expand and increase these partnerships. SSE AES’s award-winning service provides a full EERP turnkey solution for local authorities, managing the works from start to finish on a partnership basis with local authorities or housing bodies. We offer pre- and post-BERs, full project design, guidance and preparation and management of all tender documents to be fully compliant with EU procurement requirements, including full end-to-end project management.” SSE AES also compiles all certificates and associated paperwork for the local authorities to make a successful claim to the department. In addition, SSE offers financial support to the project in the form of energy credits generated, as well as offering bridging finance for local authority EERP projects. SSE AES has a body of retrofit contractors and resources ready and able to deliver in all 26 counties in the Republic of Ireland.

3. SEAI Warmer Homes

Warmer Homes is a nationwide retrofit scheme administered by the SEAI delivering free energy upgrades for households in receipt of certain government benefits. Energy retrofit measures delivered under this scheme include high energy efficiency heating systems, ventilation, external wall



“It is cosier. There was a desperate draught from that door and that is all gone. The heat – and being able to regulate it – is wonderful. It is excellent.” Local resident of Beaufort OAP Complex in Glashule.



SSE AES and Dún Laoghaire-Rathdown County Council receiving their SEAI Residential Energy Upgrade Award 2023 for the Beaufort Project. (L-R): Darrell Crowe (SSE AES), Stuart Hobbs (SSE AES), William Walsh (SEAI), Denis O’Callaghan, (Cathaoirleach, Dún Laoghaire-Rathdown County Council), James Ryan (DLR Co Co).



insulation, attic insulation and in some cases windows and doors; making these homes warmer, healthier, and more economical to run. SSE AES is a registered SEAI Warmer Homes contractor to deliver energy upgrades under this national scheme. SSE AES has delivered over 606 homes energy upgrades under this scheme since 2020 across a range of shallow and deep retrofit measures and have recently been successfully reappointed to the SEAI 2023 Warmer Homes Contract, to continue delivering energy retrofit upgrades on behalf of SEAI over the next four years.

Award winning service

SSE AES retrofit programs received awards and recognitions over the past few years for their various retrofit services. In 2023, SSE AES received nominations and secured wins

alongside their local authority partner, Dún Laoghaire-Rathdown, for their upgrade to 58 units in Beaufort OAP Complex in Glashule. These included winning the Residential Energy Upgrades Awards category at the SEAI Energy Awards 2023, the Local Authority Innovation Award category at the Chambers Ireland Excellence in Local Government Awards, and achieving the gold award in the Energy Initiative/Project of the Year at the All-Ireland Sustainability Awards. Also, our One Stop Shop Service won the Best Retrofit Service at the 2024 Bonkers Awards.

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Retrofitting Europe's ageing buildings



Carlos Ochoa, senior researcher at the Tyndall National Institute, outlines how the EU-funded DigiFab project aims to accelerate energy retrofitting across Europe through digitalisation, prefabrication, and occupant-centred design.

With 85 per cent of Europe's building stock having been built before the year 2000, buildings account for a substantial share of energy demand. "We are using 42 per cent of our energy to heat up these buildings," Ochoa explains. While deep renovation is essential, progress remains slow. "We are only doing 1 per cent as an average in Europe per year."

Traditional approaches to energy renovation face multiple barriers. "Traditional energy retrofitting is very disruptive," Ochoa explains. "It takes a lot of time, and it is also very expensive."

Prefabrication is often proposed as a solution, but uptake has been limited. "We have so many buildings, and prefabrication is, by definition, something that repeats itself," he says, highlighting the difficulty of applying standardised solutions to highly varied structures.

A lack of reliable information is another obstacle. "If you take a building from the 1950s, you are lucky if you have the plans, and therefore you have to start guessing what you have inside and then try to adapt to that kind of building."

Information is also fragmented across stakeholders. "The building managers know something, the inhabitants know another thing, the constructor knows something else, so there is nothing centralised."

Logistics further complicate matters. "You need a very well-detailed logistic plan in order to tackle prefabrication," Ochoa says, warning that, without this, "this can make it unprofitable, especially for construction SMEs". Occupant acceptance is equally critical as "when we are dealing with occupants, we have to take into account their desires, their motivation, in order to provide acceptance and cooperation".

DigiFab

The DigiFab project, funded in the context of Horizon Europe by the European Commission, seeks to address these challenges through a fully digitalised renovation process. “The project proposes energy retrofits across the EU for several building typologies,” Ochoa says, with the aim of “strengthening the value chains”.

Central to this is a shared digital backbone. DigiFab proposes “a digital process as a single source of information”, replacing fragmented data flows where “you go one way and look for documents in another”.

Accurate data collection is essential. “We are proposing using laser scanning and surveying in order to make a digital twin or BIM model of the building,” Ochoa explains, capturing both interior and exterior features. “This is to have accuracy when developing retrofitting components and minimise thermal bridging.”

The process also includes “a manual inventory of the wall conditions” to assess load-bearing capacity, resulting in “a BIM model for the energy analysis”. This information is then translated into simulation tools. “We define the baseline and the target that we must achieve,” he says, and “recommend how we can reach, for example, the BER B2, according to characteristics like the thickness and the type of technology suitable for the site”.

All data is shared through a cloud-based platform. “This is information that will be available in a proposed data cloud so that the manufacturers can use it,” Ochoa explains.

Social acceptance

A distinctive feature of DigiFab is its focus on social acceptance. “We are getting the occupant and stakeholder input through a co-creation process in which the innovations of the future are co-designed with the users themselves,” Ochoa says.

These sessions are carefully structured. “If you ask people all of a sudden what they want, they might go in a different type of conversation, so these are sessions that are guided in order to get the relevant inputs.

“The drivers are not only carbon emissions. In the Austrian demonstrator, for example, people are cooperating because they are going to get an elevator.

“Energy renovation becomes acceptable because it makes their life easier.”

User preferences also shape technical decisions. “In the traditional energy analysis, specialists may say eliminate thermal bridges, take off the balconies, but people like them and we need to account for this.”

Industrialised technologies

DigiFab integrates a range of prefabricated solutions. “We are developing lightweight concrete panels that have insulated and recycled materials,” Ochoa says, alongside, bio-based material panels, made from wood waste products.

On active façade systems, he says: “We have active heating and cooling façade elements,” he explains, which circulate hot water through the façade. In addition, “we have PV panels that are just plug and play”, combined with energy management solutions to make buildings smarter.

These systems are customised through digital design. “This is how to customise an industrial product,” Ochoa says, while “the carbon footprint is reduced compared to conventional systems”.

“Lifecycle impacts are also considered, with the rollout of lifecycle analysis calculations considering the extended lifetime of the building,” he explains. “Now we are extending it maybe another 20 or 30 years. Construction waste is minimised, and any that is generated is sent to appropriate locations for recycling.”

Speed and safety

Installation is designed to be rapid and low impact. “We are going to have 200 square metres of surface in two days,” Ochoa says, using large, prefabricated elements. The approach aims for 30 per cent reduction in costs by eliminating delays and intermediaries.

Worker safety is integrated through digital monitoring of the construction site. “The workers are wearing sensors on their clothes and helmets,” he explains, allowing detection of falls, proximity to machinery, and excessive noise exposure.

Early results are promising with a study on the EU legal framework, also including Ireland, Ochoa says, concluding that it is “mostly positive” for prefabrication.



State unlikely to meet social housing retrofit target

The target to retrofit 36,500 social housing units to a B2 standard by 2030 in line with the *Climate Action Plan* is unlikely to be met, a report by the National Oversight and Audit Commission (NOAC) has found.

The *Local Authority Performance Indicator Report*, published in September 2025, finds that current annual retrofit completions must double to reach the target. It adds that “it is not certain that it can be accomplished”.

There were 2,634 units retrofitted in 2024 of which 2,461 achieved a BER rating of B2 or above. This included the installation of 2,393 heat pumps. In 2023, there were 2,445 housing units retrofitted of which 2,315 achieved a BER rating of B2 or above. Houses retrofitted in 2024 delivered energy savings of 37,711.8 MWh and carbon emissions reductions of 10,360.3 tCO₂e.

The *National Residential Retrofit Plan 2026*, published in January 2026, states that Department of Housing has funded more than 11,000 local authority retrofits to BER B2 level “or cost optimal equivalent” between 2021 and 2025.

Retrofitting of social housing is supported by the Department through the Local Authority Energy Efficiency Retrofit Programme (EERP). A total of €140 million has been provided under the EERP for 2026 aimed at delivering around 3,500 upgrades. The plan states that €90 million was spent under the programme in 2025 to delivery 2,673 home retrofits.

In the NOAC report, local authorities advised that houses retrofitted to date were the “low hanging fruit” of housing stock, those that are easier and less expensive to retrofit. The report states: “As they progress with their programmes, they will be dealing with the older, more technically difficult, and more costly to retrofit units.”

Barriers to progress include insufficient financial and human resources and the operation of the retrofit scheme on an annual rather than multi-annual work programme.

Retrofitting in local authorities in 2024

Authority	Total houses retrofitted	Houses that achieved a BER rating of B2 or above	Number of heat pumps installed	Total annual energy savings in MWh	Total carbon emission reduction in tCO ₂ e
Carlow County	78	78	78	1,218.8	344
Cavan County	23	23	23	269.9	91.4
Clare County	44	44	44	706.2	234.6
Cork City	123	90	78	1,422.8	346.1
Cork County	152	152	151	1,698.4	633.3
Donegal County	160	160	160	1,804.8	556.6
Dublin City	408	310	255	7,323.6	1,565.8
Dún Laoghaire-Rathdown	88	88	88	766.9	171.4
Fingal County	125	105	105	1,444.9	339.8
Galway City	49	47	47	927.9	289.1
Galway County	91	91	91	1,560.7	447.5
Kerry County	13	13	10	226	83.7
Kildare County	44	43	44	538.1	162.2
Kilkenny County	38	38	38	681.4	204.5
Laois County	28	27	28	573	186.5
Leitrim County	30	30	30	317.8	102.1
Limerick City and County	2	2	2	35.3	6
Longford County	34	34	34	426	110.1
Louth County	146	145	145	2,034.3	522.3
Mayo County	23	23	23	294.1	90.5
Meath County	34	32	32	478.6	147.4
Monaghan County	127	127	127	1,585.9	453.7
Offaly County	48	48	48	912.9	303.7
Roscommon County	7	7	7	63.8	13.2
Sligo County	45	43	44	651.8	210
South Dublin County	197	197	196	2,239.1	522.7
Tipperary County	71	71	71	1,200.6	337.1
Waterford City and County	120	120	119	1,580.7	451.5
Westmeath County	83	82	79	1,623	560.9
Wexford County	118	118	117	2,006	567.8
Wicklow County	85	73	79	1,098	304.8
Totals	2,634	2,461	2,393	37,711.8	10,360.3

“Furthermore, the major urban authorities are faced with additional financial and technical challenges, in that they are required to retrofit old multi-storey flat complexes, and there is a question as to whether the existing retrofit scheme is appropriate for such units,” the report says.

Dublin City retrofitted the most homes in 2024 with 408 units, up from 259 in 2023. The report finds that many local

authorities including Donegal, Cavan, Galway County, Louth, and Laois had capacity to carry out additional retrofits which they proceeded with in some instances. However, due the lack of funding, they were unable to include any additional units in their 2024 results.

Limerick City and County reported the lowest number of retrofits with two, while Roscommon was second lowest with seven, and Kerry was third with 13.

The report outlines that Limerick City and County said that it did not have the claims submitted for the 2024 programme. Therefore, units completed in 2024 will now be counted in 2025.

“Cavan, Galway County and Leitrim expressed concern about the way the programme is funded and found it a challenge and at the current rate of progress they were doubtful of reaching their target,” the report adds.